

## European Technical Assessment

**ETA 20/0722**  
of 5.11.2021



### General part

<b>Technical Assessment Organism issuing the ETA: ITeC</b>	
ITeC has been designed in agreement with Article 29 of the Regulation (UE) No 305/2011 and it is a member of EOTA (European Organisation for Technical Assessment).	
<b>Trade name of the construction product</b>	<b>ECOSATE®</b>
<b>Product family to which the construction product belongs</b>	Product Area Code: 04 External Thermal Insulation Composite Systems (ETICS) with rendering on MW for the use as external insulation of building walls.
<b>Manufacturer</b>	<b>SAINT-GOBAIN ISOVER</b>  Príncipe de Vergara, 132 – 8 <sup>th</sup> floor ES28002 Madrid (Madrid) Spain www.isover.es
<b>Manufacturing plant(s)</b>	According to Annex N kept by ITeC.
<b>This European Technical Assessment contains</b>	18 pages including 4 annexes which form an integral part of this assessment and Annex N, which contains confidential information and is not included in the European Technical Assessment when that assessment is publicly available.
<b>This European Technical Assessment is issued in accordance with Regulation (EU) 305/2011, on the basis of</b>	EAD 040083-00-0404 <i>External Thermal Insulation Composite Systems (ETICS) with renderings</i> , edition 2019.
<b>This ETA replaces</b>	ETA 20/0722 issued on 28.10.2020.

### **General comments**

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full (excepted the confidential Annex referred to above). However, partial reproduction may be made, with the written consent of the issuing Technical Assessment Body. Any partial reproduction has to be identified as such.

## Specific parts of the European Technical Assessment

### 1 Technical description of the product

**ECOSATE®** is an ETICS (External Thermal Insulation Composite System) with rendering – a kit comprising components which are factory-produced by the manufacturer or component suppliers. The ETICS manufacturer is ultimately responsible for all components of the ETICS specified in this ETA.

The ETICS kit comprises a prefabricated insulation product of mineral wool (MW) to be mechanically fixed onto a wall with supplementary adhesive. The insulation product is faced with a rendering system consisting of several layers (site applied), one of which contains reinforcement. The rendering is applied directly to the insulating panels, without any air gap or disconnecting layer. The methods of fixing and the relevant components are specified in the table below.

The ETICS includes special fittings (e.g. base profiles, corner profiles...) to treat details of ETICS (connections, apertures, corners, parapets, sills...). The assessment and performance of these components is not addressed in this ETA, though the ETICS manufacturer is responsible for adequate compatibility and performance within the ETICS when the components are delivered as a part of the kit.

Composition of the ETICS:

	Components	Coverage (kg/m <sup>2</sup> )	Thickness (mm)
<b>Mechanically fixed ETICS with anchors with supplementary adhesive</b> (pursuant to ETA holder's instructions, the minimal bonded surface shall be 40%. National application documents shall be taken into account.)			
<b>Adhesive</b>	<b>ECOSATE® Base</b> (cement base powder requiring addition of 21% to 25 % water, 5,25 l to 6,25 l of water per 25 kg).	6 to 15	4 to 10
<b>Insulation product</b>	<b>Isover Clima 34:</b> Mineral wool panel (MW). See Annex 1 for product characteristics.	--	60 to 200
	<b>Isover TF Profi:</b> Mineral wool panels (MW). See Annex 1 for product characteristics.	--	60 to 200
	Other Isover standard mineral wool (MW) insulation panels according to EN 13162 with the characteristics described in Annex 1 and the thicknesses specified above can be used.		
<b>Base coat</b>	<b>ECOSATE® Base</b> (cement base powder requiring addition of 21% - 25% water, 5,25 l - 6,25 l water per 25 kg). Identical to the adhesive equally named above.	6 to 9	4 to 6
<b>Glass fibre mesh</b>	<b>ECOSATE® malla 160:</b> standard glass fibre mesh. See Annex 3 for product characteristics.	--	--
<b>Key coat</b>	<b>ECOSATE® primer:</b> ready to use water based alkali resistant dispersion of synthetic resins. This product has to be applied before the following finishing coats: - ECOSATE® Basic L - ECOSATE® Premium S	0,36 (prepared)	--

	Components	Coverage (kg/m <sup>2</sup> )	Thickness (mm)
	<b>ECOSATE® Basic L:</b> acrylic binder ready to use paste (particle size max. 1,5 mm). Floated finishing aspect.	2,7	1,8
	<b>ECOSATE® Premium S:</b> siloxane binder ready to use paste (particle size max. 0,8 mm). Floated finishing aspect.	1,75	1,2
<b>Fixings</b>	See Annex 2.	Remain under the ETA holder responsibility.	
	Other components:		
<b>Ancillary components</b>	<ul style="list-style-type: none"> <li>- <b>ECOSATE® perfil arranque:</b> aluminium profile and its fixing device for its use in the base of the façade.</li> <li>- <b>ECOSATE® perfil goterón:</b> PVC profile with an alkali resistant mesh for its use in corners, tops and sills of windows.</li> </ul>	Remain under the ETA holder responsibility.	

**Table 1:** Components of the ETICS **ECOSATE®**.

## 2 Specification of the intended use(s) in accordance with the applicable EAD

This ETICS is intended for use as external insulation of buildings' walls. The walls are made of masonry (bricks, blocks, stones ...) or concrete (cast on site or as prefabricated panels). The characteristics of the walls shall be verified prior to use of the ETICS, especially regarding conditions for reaction to fire classification and for fixing of the ETICS either by bonding or mechanically. The ETICS is designed to give the wall to which it is applied satisfactory thermal insulation.

The ETICS is made of non load-bearing construction components. It does not contribute directly to the stability of the wall on which it is installed, but it can contribute to its durability by providing enhanced protection from the effect of weathering.

The ETICS can be used on new or existing (retrofit) vertical walls. It can also be used on horizontal or inclined surfaces which are not exposed to precipitation.

The ETICS is not intended to ensure the airtightness of the building.

The product will be installed according to the manufacturer's instructions.

The provisions made in this ETA are based on an assumed working life of at least 25 years for **ECOSATE®** system. These provisions are based upon the current state of the art and the available knowledge and experience.

The indications given on the working life cannot be interpreted as a guarantee given by the producer but are to be regarded only as a mean for choosing the right products in relation to the expected economically reasonable working life of the works.

### 3 Performance of the product and reference to the methods used for its assessment

Performance of the system **ECOSATE®** related to the basic requirements for construction works (hereinafter BWR) were determined according to EAD 040083-00-0404 for *External Thermal Insulation Composite Systems (ETICS) with Rendering*. Essential characteristics of **ECOSATE®** are indicated in the following sections.

Essential characteristic	ETA section	Performance
<b>Basic Works Requirement 2: Safety in case of fire</b>		
Reaction to fire	3.1.1	<u>Reaction to fire of the ETICS:</u> A2-s1,d0 See table 3 for details.
		<u>Reaction to fire of the insulation material:</u> Isover Clima 34: class A2-s1,d0. Isover TF Profi: class A1.
		<u>Reaction to fire of PU foam adhesive:</u> Not relevant.
Façade fire performance	--	Not assessed
Propensity to undergo continuous smouldering of ETICS	--	Not assessed.
<b>Basic Works Requirement 3: Hygiene, health and the environment</b>		
Content, emission and/or release of dangerous substances – leachable substances	--	Not assessed.
Water absorption	3.2.1	<u>Water absorption of the base coat and the rendering system:</u> < 1 kg/m <sup>2</sup> after 1 hour < 0,5 kg/m <sup>2</sup> after 24 hours See table 4 for results.
		<u>Water absorption of the insulation product:</u> According to DoP: WS [≤ 1,0 kg/m <sup>2</sup> ] (see table A1.1).
Water tightness of the ETICS: hygrothermal behaviour	--	Test passed (without defects). The ETICS is assessed as resistant to hygrothermal cycles.
Water tightness: freeze-thaw behaviour	--	According to the water absorption test results, all combinations are freeze-thaw resistant.
Impact resistance	3.2.2	See table 5 for results.

Essential characteristic	ETA section	Performance
Water vapour permeability	3.2.3	<p><u>Water vapour permeability of the rendering system:</u> See table 6 for results.</p> <p><u>Water vapour permeability of the insulation product:</u> According to DoP: MU1 (see table A1.1).</p>
<b>Basic Works Requirement 4: Safety and accessibility in use</b>		
Bond strength between base coat and insulation product	3.3.1	< 80 kPa. Cohesive failure in the insulation product. See table 7 for results.
Bond strength between adhesive and substrate	--	Not relevant for mechanically fixed systems with supplementary adhesive.
Bond strength between adhesive and insulation product	--	Not relevant for mechanically fixed systems with supplementary adhesive.
Bond strength of the foam adhesives	--	Not relevant.
Fixing strength (transverse displacement)	--	<p>Test not required because the ETICS fulfils the two following criteria:</p> <p>Mechanically fixed ETICS with supplementary adhesive, where the bonded area exceeds 20% and <math>E \times d &lt; 50.000 \text{ N/mm}</math>,</p> <p>where:</p> <ul style="list-style-type: none"> <li>- E: modulus of elasticity of the base coat without mesh = 722 MPa.</li> <li>- d: mean dry thickness of the base coat = 5 mm.</li> </ul> <p><math>E \times d = 3.610 \text{ N/mm} &lt; 50.000 \text{ N/mm}</math>.</p>
Wind load resistance	3.3.2 Annex 4	<p><u>Pull-through test of the fixings:</u> See section 3.3.2 and Annex 4 for results.</p> <p><u>Static foam block test:</u> Not assessed.</p> <p><u>Dynamic wind uplift test:</u> Not assessed.</p> <p><u>In dry conditions:</u> According to DoP:</p> <ul style="list-style-type: none"> <li>- Isover Clima 34: TR7,5 (see table A1.1).</li> <li>- Isover TF Profi: TR10 (see table A1.1).</li> </ul>
Tensile strength perpendicular to the faces of insulation product	3.3.3	<p>See table 9 for results.</p> <p><u>In wet conditions:</u> See table 9 for results.</p>

Essential characteristic	ETA section	Performance
Shear strength and shear modulus of elasticity test of ETICS	--	Test not necessary (mechanically fixed ETICS with supplementary adhesive).
Pull-through resistance of fixings from profiles	--	Not relevant.
Render strip tensile test	--	Not assessed.
Shear strength and shear modulus of foam adhesives	--	Not relevant.
Post expansion behaviour of foam adhesives	--	Not relevant.
Bond strength after ageing	3.3.4	< 80 kPa. Cohesive rupture in the insulation product. See table 10 for results.
Mechanical and physical characteristics of the mesh	Annex 3	<u>Tensile strength of the glass fibre mesh:</u> See A3.1 for results. <u>Protection of metal mesh:</u> Not relevant.
<b>Basic Works Requirement 5: Protection against noise.</b>		
Airborne sound insulation of ETICS	--	Not assessed.
Dynamic stiffness of the thermal insulation product	--	Isover clima 34: Not assessed. Isover TF Profi (100 mm): 9,2 MN/m <sup>3</sup> .
Air flow resistance of the thermal insulation product	--	Isover clima 34: Not assessed. Isover TF Profi: - 100 mm: 23,8 kPa·s/m <sup>2</sup> . - 160 mm: 21,4 kPa·s/m <sup>2</sup> .
<b>Basic Works Requirement 6: Energy economy and heat retention.</b>		
Thermal resistance and thermal transmittance of ETICS	3.4.1	See section 3.4.1 and table 11 for results and calculations.

Table 2: Essential characteristics of the ETICS ECOSATE®.

### 3.1 Safety in case of fire (BWR 2)

#### 3.1.1 Reaction to fire

EAD 040083-00-0404, clause 2.2.1.

The reaction to fire of the system **ECOSATE®** according to EN 13501-1 is defined in table 2.

<b>ETICS Configuration</b>	<b>Reaction to fire classification acc. to EN 13501-1</b>
Adhesive: ECOSATE® Base	
Insulation: : mineral wool with a reaction to fire class of A2-s1,d0	
Base coat: ECOSATE® Base	
Glass fibre mesh: ECOSATE® malla 160	A2-s1,d0
Key coat: ECOSATE® primer	
Finishing coat: <ul style="list-style-type: none"> <li>- ECOSATE® Basic L</li> <li>- ECOSATE® Premium S</li> </ul>	

**Table 3:** Reaction to fire classification for the different configurations of **ECOSATE®**.

Note: A European reference fire scenario has not been laid down for facades. In some Member States, the classification of ETICS according to EN 13501-1 might not be sufficient for the use in facades. An additional assessment of ETICS according to national provisions (e.g. on the basis of a large scale test) might be necessary to comply with Member State regulations, until the existing European classification system has been completed.

## 3.2 Hygiene, health and environment (BWR 3)

### 3.2.1 Water absorption

*EAD 040083-00-0404, clause 2.2.5.1.*

Base coat **ECOSATE® Base**:

- Water absorption after 1 hour < 1 kg/m<sup>2</sup>
- Water absorption after 24 hours < 0,5 kg/m<sup>2</sup>

<b>Rendering system</b>	<b>Water absorption (kg/m<sup>2</sup>)</b>	
	<b>After 1 hour</b>	<b>After 24 hours</b>
Base coat + key coat + finishing coats, indicated hereafter:		
<b>ECOSATE® Base + ECOSATE® primer + ECOSATE® Basic L</b>	< 0,5 (test result: 0,019)	< 0,5 (test result: 0,219)
<b>ECOSATE® Base + ECOSATE® primer + ECOSATE® Premium S</b>	< 0,5 (test result: 0,030)	< 0,5 (test result: 0,147)

**Table 4:** Water absorption test results (mean values).



### 3.2.2 Impact resistance

EAD 040083-00-0404, clause 2.2.8.

Finishing coat	Diameter of the impact of 3 Joule (mm)	Diameter of the impact of 10 Joule (mm)	Category
ECOSATE® Basic L**	0	17	I
	0	20	
	0	24	
	No cracks	No cracks	
ECOSATE® Premium S*	11,7	24,2	I
	10,0	26,7	
	12,0	32,7	
	9,4	23,8	
	8,5	25,8	
	No cracks	No cracks	

\*Finishing coat tested on small samples.

\*\*Finishing coat tested on the rig.

**Table 5:** Category of use according impact resistance test results.

### 3.2.3 Water vapour permeability

EAD 040083-00-0404, clause 2.2.9.1.

Rendering system	Characteristics	Equivalent air thickness $S_d$ (m)
Base coat + key coat + finishing coats, indicated hereafter:		
ECOSATE® Base + ECOSATE® primer + ECOSATE® Basic L	Particle size max. 1,5 mm. Floated finishing aspect.	$\leq 1,0$ (test result: 0,40)
ECOSATE® Base + ECOSATE® primer + ECOSATE® Premium S	Particle size max. 0,8 mm. Floated finishing aspect.	$\leq 1,0$ (test result: 0,27)

**Table 6:** Water vapour permeability test results.

## 3.3 Safety and accessibility in use (BWR 4)

### 3.3.1 Bond strength between base coat and insulation product

EAD 040083-00-0404, clause 2.2.11.1.

Bond strength between base coat and insulation product: < 80 kPa (cohesive rupture in the insulation product).

	Bond strength		
	Minimum value (kPa)	Mean value (kPa)	Rupture typology
On samples after 28 days drying under the same conditions of the rig	5,0	6,0	C
After hygrothermal cycles on the rig	17,0	44,0	C

A: adhesive rupture; B: cohesive rupture in adhesive; C: cohesive rupture in insulation product.

**Table 7:** Bond strength between the base coat and the insulation product.

### 3.3.2 Wind load resistance of mechanically fixed ETICS

EAD 040083-00-0404, clause 2.2.13. – Pull-through test of fixings.

<b>Anchors</b>	<b>Plate diameter (mm)</b>	≥ 60	
	<b>Plate stiffness (kN/mm)</b>	≥ 0,6	
<b>Insulation product</b>	<b>Type</b>	Isover Clima 34	
	<b>Tensile strength perpendicular to the faces (kPa)</b>	5,7	6,3
	<b>Thickness (mm)</b>	≥ 60	≥ 100
	<b>Anchors placed at the body of the insulation product</b>	<b>R<sub>panel</sub> (kN) in dry conditions</b>	Minimal: 0,185 Mean: 0,234
<b>Anchors placed at joints of the insulation product</b>	<b>R<sub>panel</sub> (kN) in wet conditions</b>	Minimal: 0,082 Mean: 0,091	Not assessed Not assessed

**Table 8:** Pull-through test results for anchors with a plate stiffness ≥ 0,6 kN/mm and with Isover Clima 34.

See the load/displacement graph in the Annex 4.

The design load resistance of the ETICS fixed with anchors is determined as follows:

$$R_d = \frac{R_{panel} \cdot n_{panel} + R_{joint} \cdot n_{joint}}{\gamma}$$

Where:

$n_{panel}$  number of anchors not placed at the panel joint, per m<sup>2</sup>

$n_{joint}$  number of anchors placed at the panel joint, per m<sup>2</sup>

$\gamma$  national safety factor

The test results are also valid for:

- Insulation product of the same type with higher thickness and/or higher tensile strength perpendicular to the faces as Isover TF Profi.
- Anchors with the same or larger plate diameter and/or the same or higher plate stiffness (see EOTA Technical Report n° 26).

### 3.3.3 Tensile test perpendicular to the faces of thermal insulation product

EAD 040083-00-0404, clause 2.2.14.

Thickness (mm)	Isover Clima 34		Isover TF Profi		
	60	120	100		
Tensile strength perpendicular to the faces (kPa)	Dry conditions (according to DoP)		7,5	10,0	
	Dry conditions	Mean	5,7	7,83	10,3
		Min.	4,8	7,15	8,7
	Wet conditions after 7 days	Mean	4,3	-	-
		Min.	3,2	-	-
	Wet conditions after 28 days	Mean	2,9	-	-
		Min.	2,5	-	-

**Table 9:** Tensile strength perpendicular to the faces of the thermal insulation product.

### 3.3.4 Bond strength after ageing

EAD 040083-00-0404, clause 2.2.20.

Rendering system tested	Bond strength (kPa)	
	Individual	Mean
<i>Base coat + key coat + finishing coats, indicated hereafter:</i>		
<b>ECOSATE® Base + ECOSATE® primer + ECOSATE® Basic L (*)</b>	26	27
	31	
	28	
	32	
	17	
<b>ECOSATE® Base + ECOSATE® primer + ECOSATE® Premium S</b>	5	6
	6	
	7	
	7	
	6	

Note:

- In all cases a cohesive rupture has occurred in the insulation product.
- (\*) Tested on the rig after hygrothermal cycles.

**Table 10:** Bond strength test results (mean values).

### 3.4 Energy economy and heat retention (BWR 6)

#### 3.4.1 Thermal resistance and thermal transmittance of ETICS

EAD 040083-00-0404, clause 2.2.23 – Thermal resistance and thermal transmittance

The thermal resistance of the ETICS is calculated as follows (see table 11).

Insulation product	Thermal conductivity (W/m·K)	Thickness <sup>1</sup> (mm)	Thermal resistance (m <sup>2</sup> ·K/W) <sup>(2)</sup>		
			R <sub>insulation</sub>	R <sub>render</sub>	R <sub>ETICS</sub>
Isover clima 34	0,034	60	1,76	0,02	1,78
		200	5,88		5,90
Isover TF Profi	0,035	60	1,71	0,02	1,73
		200	5,71		5,73

(1) Minimum and maximum thickness considered in the ETA.

(2) R<sub>insulation</sub>: Thermal resistance of the insulation panel (in accordance with the Declaration of Performance of the insulation panels).

R<sub>render</sub>: Thermal resistance of the render (base coat + key coat + finishing coat). See section 2.2.23.1 of EAD 040083-00-0404.

R<sub>ETICS</sub>: Thermal resistance of the ETICS (R<sub>ETICS</sub> = R<sub>insulation</sub> + R<sub>render</sub>).

**Table 11:** Thermal resistance of the ETICS.

The thermal transmittance of the substrate wall covered by the ETICS is calculated in accordance with the standard EN ISO 6946:

$$U_c = U + \chi_p * n$$

Where:  $\chi_p * n$ : has to be taken into account only if it is greater than 0,04 W/(m<sup>2</sup>·K).

U<sub>c</sub>: global (corrected) thermal transmittance of the covered wall W/(m<sup>2</sup>·K).

n: number of anchors (through insulation product) per m<sup>2</sup>.

$\chi_p$ : local influence of thermal bridge caused by anchor. The values listed below can be taken into account if not specified in the anchor's ETA:

= 0,002 W/K for anchors with a stainless steel screw covered by plastic material and for anchors with an air gap at the head of the screw ( $\chi_p * n$  negligible for n<20).

= 0,004 W/K for anchors with a galvanized steel screw with the head covered by a plastic material ( $\chi_p * n$  negligible for n<10).

= negligible for anchors with plastic nails (reinforced or not with glass fibres...).

U: thermal transmittance of the normal part of the covered wall (excluding thermal bridges) (W/(m<sup>2</sup>·K)) determined as follows:

$$U = \frac{1}{R_i + R_{render} + R_{substrate} + R_{se} + R_{si}}$$

Where:

R<sub>i</sub>: thermal resistance of the insulation product (according to declaration of performance) in (m<sup>2</sup>·K)/W.

R<sub>render</sub>: thermal resistance of the render (about 0,02 (m<sup>2</sup>·K)/W).

$R_{\text{substrate}}$ : thermal resistance of the substrate of the building (concrete, brick...) in  $(\text{m}^2 \cdot \text{K})/\text{W}$ .

$R_{\text{se}}$  external surface thermal resistance in  $(\text{m}^2 \cdot \text{K})/\text{W}$ .

$R_{\text{si}}$  internal surface thermal resistance in  $(\text{m}^2 \cdot \text{K})/\text{W}$ .

#### 4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

According to the decision 97/556/EC amended by Decision 2001/596/EC, as amended of the European Commission<sup>1</sup>, the systems of AVCP (see EC delegated regulation (EU) No 568/2014 amending Annex V to Regulation (EU) 305/2011) given in table 9 applies.

Trade name of the system	Intended use(s)	Level(s) or class(es) (Reaction to fire)	AVCP system
ECOSATE®	External thermal insulation composite system/kits (ETICS) with rendering in external walls subject to fire regulations.	A1 <sup>(2)</sup> , A2 <sup>(2)</sup> , B <sup>(2)</sup> , C <sup>(2)</sup> , D, E, F or A1 <sup>(3)</sup> to E <sup>(3)</sup>	1, 2+
	External thermal insulation composite system/kits (ETICS) with rendering in external walls not subject to fire regulations.	Any	2+

- (1) Products/material for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limit of organic material).
- (2) Products/materials not covered by note 1.
- (3) Products/materials that do not require to be tested for reaction to fire (e.g. products/materials of classes A1 according to Commission Decision 96/603/EC).

**Table 12:** Applicable AVPC system.

#### 5 Technical details necessary for the implementation of the AVCP system, as foreseen in the applicable EAD

All the necessary technical details for the implementation of the AVCP system are laid down in the *Control Plan* deposited with the ITeC<sup>2</sup>, with which the factory production control shall be in accordance.

Products not manufactured by the kit manufacturer shall also be controlled according to the Control Plan. Where materials/components are not manufactured and tested by the supplier in accordance with agreed methods, then they shall be subject to suitable checks/tests by the kit manufacturer before acceptance.

Any change in the manufacturing procedure which may affect the properties of the product shall be notified and the necessary type-testing revised according to the *Control Plan*.

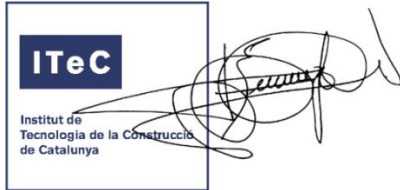
<sup>1</sup> Diario Oficial de la Unión Europea (DOUE) L229/15 de 20/08/1997.

Diario Oficial de la Unión Europea (DOUE) L209/33 de 02/08/2011.

<sup>2</sup> The *Control Plan* is a confidential part of the ETA and is only handed over to the notified certification body involved in the assessment and verification of constancy of performance.

Issued in Barcelona on 5 November 2021

by the Catalonia Institute of Construction Technology.



Ferran Bermejo Nualart  
Technical Director, ITeC

**ANNEX 1: Insulation product characteristics**

Descriptions and characteristics	MW panels	
	Isover clima34	Isover TF Profi
	Factory-prefabricated uncoated boards with straight edges for mechanically fixed ETICS, made of mineral wool (MW) according to EN 13162.	
Description	One density	One density
	Glass wool board	Rock wool board
Reaction to fire EN 13501-1 (*)	A2-s1,d0	A1
Thermal resistance ((m <sup>2</sup> ·K)/W)	Defined in the CE marking	Defined in the CE marking
Thermal conductivity (W/(m·K)) (*)	0,034	0,035
Thickness EN 823 (*)	T5 [-1% or -1 mm and + 3 mm]	T5 [-1% or -1 mm and + 3 mm]
Durability or the thermal resistance against heat, watering, ageing / degradation (*) EN 1604	NPD	DS(70,90)
Tensile strength (kPa) (*) EN 1607	TR7,5	TR10
Compressive strength (kPa) (*) EN 826	CS(10/Y)15	CS(10\Y)30
Compressive strength - Point Load (N) (*) EN 12430	NPD	NPD
Water absorption (short term) (*) EN 1609	WS [≤ 1,0 kg/m <sup>2</sup> ]	WS [≤ 1,0 kg/m <sup>2</sup> ]
Water absorption (long term) (*) EN 12087	NPD	WL(P) [≤ 3,0 kg/m <sup>2</sup> ]
Water vapour diffusion resistance factor (μ) (*) EN 12086	MU1	MU1

\* Characteristics of the insulation products declared in the DoP.

**Table A1.1:** Characteristics of insulation products.

## ANNEX 2: Anchors characteristics

Anchors with an ETA according to EAD 330196-01-0604 (or according to ETAG 014 used as EAD).

The anchors are composed of a plastic expansion sleeve with a plate  $\varnothing$  60 mm, and a plastic or metallic nail or screw. It is mandatory to use ECOSATE® SBL 140 (a plate  $\varnothing$  140 mm) when using ECOSATE® H1 in combination with Isover Clima 34.

Use categories and characteristic resistances in the substrate are given in each anchor's ETA.

Trade name	ETA reference	Mounting <sup>(1)</sup>	Plate stiffness (kN/mm)
ECOSATE® H1	ETA 11/0192	a	≥ 0,6
ECOSATE® STR U 2G	ETA 04/0023	a,b	≥ 0,6

Notes:

a: surface mounting;

b: countersunk mounting is possible but this case has not been assessed in this ETA.

**Table A2.1:** Characteristic of the fixings for the insulation products.



**ANNEX 3: Glass fibre mesh characteristics**

Trade name: ECOSATE® malla 160.

Mesh size: 3,5 mm x 3,8 mm.

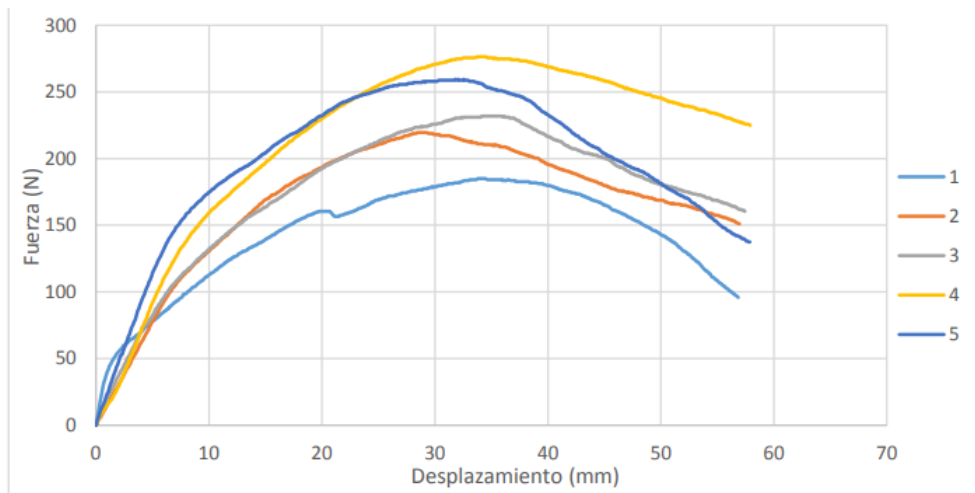
Weight per unit area  $\geq 160$  g/m<sup>2</sup>.

ETA reference: ETA 13/0392.

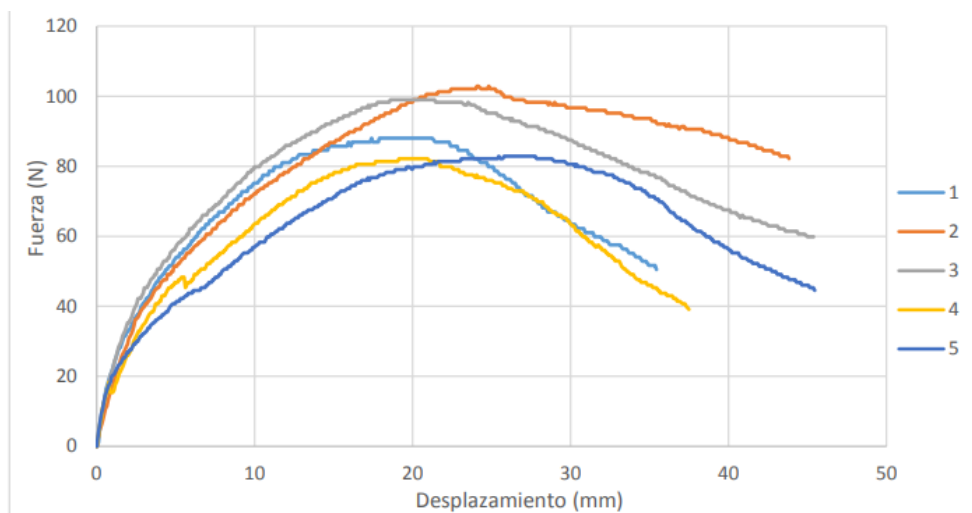
	ECOSATE® malla 160		Required value
	Warp	Weft	
Tensile strength in the as-delivered state (mean value)	38,5 N/mm	56,5 N/mm	--
Tensile strength after artificial ageing (mean value)	25,0 N/mm	37,4 N/mm	> 20 N/mm
Residual strength after artificial ageing	65 %	66 %	> 50%
Elongation in as-delivered state (mean value)	2,57 %	3,34 %	--
Elongation after artificial ageing (mean value)	1,64 %	2,10 %	--

**Table A3.1:** Test results and requirements of the glass fibre mesh **ECOSATE® malla 160**.

**ANNEX 4: Load/Displacement graphs of the pull-through test**



**Figure A4.1:** Load/Displacement graph of pull-through test of Isover Clima 34 (TR 7,5) with a thickness of 60 mm in dry conditions when the fixings are placed in the body of the insulation product and a plate stiffness  $\geq 0,6$  kN/mm.



**Figure A4.2:** Load/Displacement graph of pull-through test of Isover Clima 34 (TR 7,5) with a thickness of 60 mm in wet conditions when the fixings are placed in the joints of the insulation product and a plate stiffness  $\geq 0,6$  kN/mm.